

5 a capacitor charged by a power source device through a resistor;

6 a current detecting element for detecting a short circuit;

7 a switching element intervening a discharge circuit between the  
8 capacitor, and at least one of the tool electrode, the workpiece and the power  
9 source;

10 a control unit for controlling switching timing in accordance with a  
11 result of detecting a short circuit,

12 wherein a short circuit detection signal is input, the switching  
13 element is turned off and, after predetermined time, the switching element is  
14 turned on.

1 28. (Newly Added) An electro discharge machining apparatus  
according to claim 27, further comprising:

3 a drive control unit for controlling movement of the tool electrode,

4 wherein the short circuit detection signal is input, the tool electrode  
5 is moved to increase a gap between the tool electrode and the workpiece.

1 29. (Newly Added) An electro discharge machining apparatus  
according to claim 27, further comprising:

3 a motor for rotating the tool electrode; and

4 a second holder for holding the motor and the tool electrode,

5 wherein the second holder is made of a low thermal expansive  
6 substance.

1 30. (Newly Added) An electro discharge machining apparatus  
2 according to claim 29, wherein the coefficient of thermal expansion of the low  
3 thermal expansive substance is  $5 \times 10^{-6}$  or less.

1                   31. (Newly Added) An electro discharge machining apparatus  
2 according to claim 29, wherein the low thermal expansive substance is an invar  
3 alloy.

1                   32. (Newly Added) An electro discharge machining apparatus  
2 according to claim 27, further comprising:

3                   a motor for rotating the tool electrode; and  
4                   a second holder for holding the motor and the tool electrode,  
5                   wherein an thermal isolator is equipped between the motor and the  
6 second holder.

1                   33. (Newly Added) An electro discharge machining apparatus  
2 according to claim 27, further comprising:

3                   a motor for rotating the tool electrode; and  
4                   a second holder for holding the tool electrode,  
5                   wherein space is set between the motor and the second holder.

1                   34. (Newly Added) An electro discharge machining apparatus ,  
2 comprising:

3                   a first holder for holding a workpiece;  
4                   a tool electrode arranged opposite to the workpiece;  
5                   a capacitor charged by a power source device through a resistor;  
6 and  
7                   a switching element intervening a discharge circuit between the  
8 capacitor, and at least one of the tool electrode, the workpiece and the power  
9 source; and

10                   a switch controller for controlling on and off of the switching  
11                   element,

12                   wherein the switching element alternatively is turned on and off so  
13                   that duration of the pulse electro discharge is less than or equal to a  
14                   predetermined time.

1                   35. (Newly Added) An electro discharge machining apparatus  
2                   according to claim 34, wherein the predetermined time is a time from the  
3                   beginning of the pulse electro discharge to the onset of electrolysis in one of the  
4                   tool electrode and the workpiece.

1                   36. (Newly Added) An electro discharge machining apparatus  
2                   according to claim 34, further comprising:

3                   a motor for rotating the tool electrode; and  
4                   a second holder for holding the motor and the tool electrode,  
5                   wherein the second holder is made of a low thermal expansive  
6                   substance.

1                   37. (Newly Added) An electro discharge machining apparatus  
2                   according to claim 36, wherein the coefficient of thermal expansion of the low  
3                   thermal expansive substance is  $5 \times 10^{-6}$  or less.

1                   38. (Newly Added) An electro discharge machining apparatus  
2                   according to claim 36, wherein the low thermal expansive substance is an invar  
3                   alloy.

1                   39. (Newly Added) An electro discharge machining apparatus  
2                   according to claim 34, further comprising:

3                   a motor for rotating the tool electrode; and  
4                   a second holder for holding the motor and the tool electrode,

5                   wherein an thermal isolator is equipped between the motor and the  
6                   second holder.

1                   40. (Newly Added) An electro discharge machining apparatus  
2                   according to claim 34, further comprising:

3                   a motor for rotating the tool electrode; and

4                   a second holder for holding the tool electrode,

5                   wherein space is set between the motor and the second holder.

1                   41. (Newly Added) An electro discharge machining apparatus,  
2                   comprising:

3                   a first holder for holding a workpiece;

4                   a tool electrode arranged opposite to the workpiece;

5                   a capacitor charged by a power source device through a resistor;

6                   a current detecting element for detecting a current between the tool  
7                   electrode and the workpiece;

8                   a control unit for, based on the current detected by the current  
9                   detecting element, judging whether or not a period of pulse electro discharge is  
10                  less than or equal to a predetermined period; and

11                  an adjuster for, when it is judged that the period of the pulse  
12                  electro discharge is less than or equal to the predetermined period, adjusting an  
13                  electric resistance value between the power source and the capacitor so that the  
14                  period of the pulse electro discharge is greater than the predetermined period.

1                   42. (Newly Added) An electro discharge machining apparatus  
2                   according to claim 41, further comprising:

3                   a motor for rotating the tool electrode; and

4                   a second holder for holding the motor and the tool electrode,  
5                   wherein the second holder is made of a low thermal expansive  
6                   substance.

1                   43. (Newly Added) An electro discharge machining apparatus  
2                   according to claim 42, wherein the coefficient of thermal expansion of the low  
3                   thermal expansive substance is  $5 \times 10^{-6}$  or less.

1                   44. (Newly Added) An electro discharge machining apparatus  
2                   according to claim 42, wherein the low thermal expansive substance is an invar  
3                   alloy.

1                   45. (Newly Added) An electro discharge machining apparatus  
2                   according to claim 41, further comprising:

3                   a motor for rotating the tool electrode; and

4                   a second holder for holding the motor and the tool electrode,

5                   wherein an thermal isolator is equipped between the motor and the  
6                   second holder.

1                   46. (Newly Added) An electro discharge machining apparatus  
2                   according to claim 41, further comprising:

3                   a motor for rotating the tool electrode; and

4                   a second holder for holding the tool electrode,

5                   wherein space is set between the motor and the second holder.

1                   47. (Newly Added) An electro discharge machining apparatus,  
2                   comprising:

3                   a first holder for holding a workpiece;

4                   a tool electrode arranged opposite to the work piece;

5                   a capacitor charge by a power source device through a resistor;

6                   a current detecting element for detecting a short circuit;

7                   a control unit for, based on the current detected by the current

8                   detecting element, judging whether or not a short circuit has occurred for a

9                   predetermined time between the workpiece and the tool electrode; and

10                  an adjuster for, when it is judged that a short circuit has occurred

11                  for the predetermined time between the workpiece and the tool electrode,

12                  adjusting an electric resistance value between the power source and the capacitor

13                  so that a period of the pulse electro discharge is elongated.

1                  48. (Newly Added) An electro discharge machining apparatus  
2                  according to claim 47, further comprising:

3                  a motor for rotating the tool electrode; and

4                  a second holder for holding the motor and the tool electrode,

5                  wherein the second holder is made of a low thermal expansive

6                  substance.

1                  49. (Newly Added) An electro discharge machining apparatus  
2                  according to claim 48, wherein the coefficient of thermal expansion of the low  
3                  thermal expansive substance is  $5 \times 10^{-6}$  or less.

1                  50. (Newly Added) An electro discharge machining apparatus  
2                  according to claim 48, wherein the low thermal expansive substance is an invar  
3                  alloy.

1                  51. (Newly Added) An electro discharge machining apparatus  
2                  according to claim 47, further comprising:

3                  a motor for rotating the tool electrode; and

4                  a second holder for holding the motor and the tool electrode,

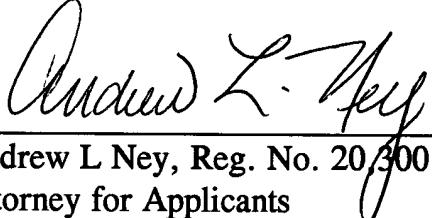
5                   wherein an thermal isolator is equipped between the motor and the  
6   second holder.

1                   52. (Newly Added) An electro discharge machining apparatus  
2   according to claim 47, further comprising:

3                   a motor for rotating the tool electrode; and  
4                   a second holder for holding the tool electrode,

5                   wherein space is set between the motor and the second holder.

Respectfully Submitted,



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